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SEMI-ANNUAL PROGRESS REPORT

RESEARCH ON ENZYMES, HORMONES, AND INTERMEDIARY METABOLISM

July 1, 1952 through Dec. 31, 1952

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Michael Doudoroff, Principal Investigator

Regents of the University of California, Contractors

Sub-task No. NR 123-116/6-12-51 (Biol. Sciences Division)

Contract No. Nonr-637 (00)

(1) The studies on the phosphorolysis of maltose by meningococcus and on a new mechanism of glucose oxidation by Pseudomonas saccharophila have been completed and reported (1,2,3,4)

(2) Extensive preliminary studies on the metabolism of E. coli and P. putrefaciens have indicated that the fundamental problems outlined in the contract can be better attacked in studies with P. saccharophila; hence, work with these organisms has been temporarily discontinued.

(3) Adaptation of P. saccharophila to fructose, sucrose and glucose has been investigated. The utilization of free hexoses appears to involve a mutational phenomenon, whereas sucrose can be utilized by all cells. A specific fructokinase is produced in response to fructose or sucrose, but its presence does not necessarily insure the ability of the organism to use exogenously supplied fructose. Further studies are in progress.

(4) The study of the sucrose phosphorylases from P. saccharophila, P. putrefaciens, and Leuconostoc has been initiated. Large amounts of cells have been harvested and preliminary studies on the purification of the enzymes are in progress.

Publications:

Notes: (1) Fitting, C. and Doudoroff, M. Enzymatic phosphorolysis of maltose with the production of β-glucose-1-phosphate. Fed. Proc. 11, 212 (1952)

(2) Fitting, C. and Doudoroff, M. Studies on the phosphorolysis of maltose with enzyme preparations from Neisseria meningiditis. Bact. Proc. p. 144 (1952)

Papers: (3) Fitting, C. and Doudoroff, M. Phosphorolysis of maltose by enzyme preparations from Neisseria meningiditis. J. Biol. Chem. 199, 153 (1952)

(4) Entner, N. and Doudoroff, M. Glucose and gluconic acid by Pseudomonas saccharophila involving the split of gluconic acid to two C_3 units. J. Biol. Chem. 196, 853 (1952)